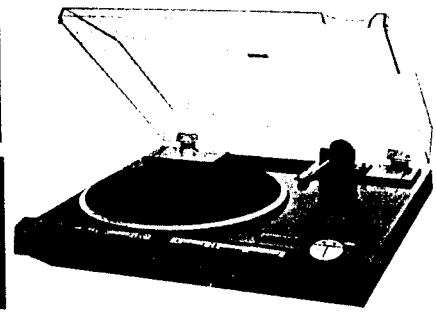
PIONEER

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ART-697-0

STEREO TURNTABLE

PL-L1000A

MODEL PL-L1000A COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
S/G	110V,120V,220V,240V (Switchable)	U.S. military model
HET	220V and 240V (Switchable)	Europe model (without cartridge)
HBT	220V and 240V (Switchable)	U.K. model (without cartridge)

- This is the service manual for model PL-L1000A/S/G. For model PL-L1000A/HET, HBT types, please refer to page 25.
- For the circuit description and troubleshooting, etc., please refer to the Service manual of PL-9 and PL-L800.

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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1. SPECIFICATIONS

Motor and Turntable

Drive System ..... Direct-drive
Motor ..... Ouartz PLL Hall motor
Turntable Platter .. 310mm diam. aluminum alloy die-cast
Inertial Mass .... 330kg-cm^2 (including platter mat mass)
Speeds ..... 33-1/3 and 45rpm
Wow and Flutter ..... Less than *0.012% (WRMS)
0.023% (WRMS)
0.035% (DIN)

Values marked with an "*" designate the wow and flutter for motor, and do not include the cartridge or tonearm load.

Signal-to-Noise Ratio ..... More than 78dB (DIN-B)
(with Pioneer cartridge model PC-4MC)

Rotational Characteristics

Build-up Time ..... within 180° rotation at 33-1/3rpm
Speed Deviation ..... Less than 0.002%
Speed vs. Load Characteristics .... Stable up to 200 grams drag load
Speed Drift ..... Less than 0.00008%/h at 33-1/3rpm
Less than 0.00003%/degree temp change at 33-1/3rpm

Tonearm

Type ..... Linear Motor Direct-drive
Static-balance type, Linear-tracking arm
Effective Arm Length 190mm
Overhang 0mm
Usable Catridge Weight
(including headshell weight) .... 6g (min.) to 32g (max.)
Arm Height Adjust Range ..... ±3mm
Headshell weight 10.5g

Subfunctions

Auto lead-in
Auto-return
Auto cut
Quick repeat
Quick play
Quick stop
Stylus pressure direct-readout counterweight
Arm height adjusting device
Cueing device
Free stop hinges

PC-4MC Specifications

Type ..... Moving coil type
Stylus ..... 0.3 x 0.7 mil diamond (PN-4MC)
Output Voltage ..... 1.5mV (1kHz, 50mm/s Peak velocity, LAT)
Tracking Force ..... 1.7g to 2.3g (proper 2g)
Frequency Response ..... 10 to 35,000Hz
Recommended Load 50kΩ
Weight 3.1g

Miscellaneous

Power Requirements
AC110/120/220/240V ~ (switchable), 50, 60Hz
Power Consumption 10W
Dimensions ..... 494(W) x 154(H) x 456(D)mm
19-7/16(W) x 6-1/16(H) x 17-15/16(D) in.
Weight ..... 13.5 kg/29 lb 13 oz

Accessories

EP Adapter 1
Screwdriver 1
Sub-weight 1
Overhang gauge 1
Level 1
Cleaning cloth 1
Headshell and cartridge 1
Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561*	*RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473*	*RD¼PS* 4 7 3	*J*
0.5Ω	*0R5*		*RN2H* 0 R 5	*K*
1Ω	*010*		*RS1P* 0 1 0	*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Control Assembly (XWM-075)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 220M 10L	C1
	(CEA 220M 16L)	
	CEA 100M 25L	C7,C8
	(CEA 100M 35L)	
	CEA 2R2M 50L	C6,C13
	CEA 100M 16L	C2
	(CEA 100M 25L)	
	(CEA 100M 35L)	
	CKDYF 103Z 50	C9,C10
	CKDYF 473Z 50	C11,C12
	CKDYF 104Z 50	C5
	CEA 010M 50L	C14,C15

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
★	PCP-003	VR1	Semi-fixed 2.2k(B)
	(PCP-043)		
★	PCP-047	VR2	Semi-fixed220(B)
	(PCP-034)		
	PCP-038	VR3	Semi-fixed 330(B)
★	PCP-037	VR4,VR5	Semi-fixed 680k(B)
		VR6,VR7	
	RD¼PM □□□J	R1,R2,R6–R31,R34–R39	
	RGSD5X472J	R3,R4	
	RGSD8X472J	R5	
	RN¼PR1301F	R32,R33	
	(RN¼RR1301G)		

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PD6005	IC1
★★	MB84069B	IC2
	(TC4069UBP)	
★★	M53207P	IC3
★★	μPC4558C	IC4
	(NJM4558D)	
★★	BA6208	IC5
★★	μPC78L08	IC6
★★	2SC1959	Q1
★★	2SC1815	Q2,Q8,Q9
	(2SC945)	
★★	2SA1015	Q3
	(2SA733)	
★★	2SC1626	Q4,Q5
	(2SC1061)	
★★	2SA816	Q6,Q7
	(2SA671)	
★	1S2473	D1,D2
	(1S1555)	
★	BZ-081	D3
★	1N4002	D4
	(1S1885)	

OTHERS

Mark	Part No.	Symbol & Description	
★	PCX-054	TH1,TH2	Thermistor
★	KMFC1033S		Seramic resonator

LED Assembly (XWX-075)

Mark	Part No.	Symbol & Description
	RGSD5X561J	R301
★	TLR121	D301–D305

Photo Tr Assembly (XWX-077)

Mark	Part No.	Symbol & Description
★★	TPS605-B	Q301–Q305
	PNC-153	Slit board
	PDE-109	Connector assembly

Lamp Assembly (XWX-040)

Mark	Part No.	Symbol & Description
★★	PEL-041	Lamp

Control (A) Assembly (XWX-076)

Mark	Part No.	Symbol & Description	
★★	PSG-025	S3,S4	Switch (SPEED,SIZE)
	PDE-065		Connector assembly

Control (B) Assembly (XWX-074)

Mark	Part No.	Symbol & Description	
★★	PSG-025	S5,S6,S7	Switch (REPEAT,ARM ELEVATION, START/STOP)
	PDE-118		Connector assembly

Location Assembly (XWX-072)

Mark	Part No.	Symbol & Description	
★★	PSG-030	S8,S9	Switch (ARM LOCATION)
	PDE-107		Connector assembly

Connection Assembly (XWX-073)

Mark	Part No.	Symbol & Description	
★★	PSG-035	S10	Switch

Power Supply Assembly (PWR-067)

CAPACITORS

Mark	Part No.	Symbol & Description
⚠	PCL-005	C101
	CEA 471M 25L	C103
	CEA 471M 50L	C104
	CEA 101M 10L	C105
	CEA 101M 35L	C106,C109
	CKDYF 103Z 50	C108

RESISTOR AND SEMICONDUCTORS

Mark	Part No.	Symbol & Description	
	RS2PF222J	R101	
★★	μPC78M05H	IC101	
★★	2SD837	Q101	
★	PCX-010	D101	Bridge stack
★	S2VB10	D102	Bridge stack
★	MZ-250 (WZ-250)	D103	

OTHERS

Mark	Part No.	Symbol & Description
	PDE-106	Connector assembly
	PNM-013	Spacer
	PNX-015	Spacer
	PBA-089	Screw
	PAZ30P060FMC	Screw

Circuit Board Assembly (PWM-078)

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C1,C4,C12,C13,C25,C26,C27
	CQMA 822K 50	C5
	CQMA 333K 50	C8, C24
	CQMA 104K 50	C6,C7
	CCDCH 330J 50	C2
	CCDCH 560J 50	C3
	CKDYF 472Z 50	C9
	CKDYF 104Z 50	C28
	CEA R47P 50 (CEA R47M 50L)	C10,C14,C15
	CEA 100P 16 (CEA 100M 50L)	C17
	CEA 100P 35 (CEA 100M 50L)	C18,C19,C20–C22
	CEA 330P 10 (CEA 330M 16L)	C23
	CEA 101P 10 (CEA 101M 50L)	C11
	CSZA R22M 35 (CSYA R22M 50)	C16

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2007	IC1
★★	PA2008	IC2
★★	PD1003	IC3
★★	TD62503P	IC4
★★	2SC1815-GR (2SC945-P)	Q1
★	1S2473	D1

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

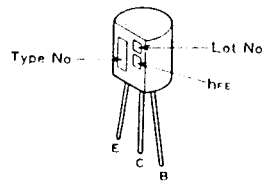
Mark	Part No.	Symbol & Description	
★	PCP-053	VR1	Semi-fixed 22k(B)
★	PCP-052	VR2	Semi-fixed 47k(B)
	RD¼PM □□□J	R1,R2,R5–R8,R10–R16	
	RN1PF2R2J	R9	
	RN¼PR363G	R3	
	(RN¼PR3572G)		
	(RN¼PR3652G)		
	RN¼PR1103G	R4	

OTHES

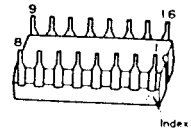
Mark	Part No.	Symbol & Description
★	PSS-003	X'tal
★	PCX-039	Hole element HA, HB
	PDE-111	Connector assembly

External Appearance of Transistors & ICs

2SA1015
2SC1815
2SC1815-GR
2SC1959

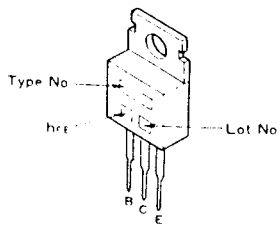


PA2007
PD1003
TD62503P

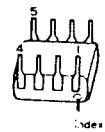


TPS605-B

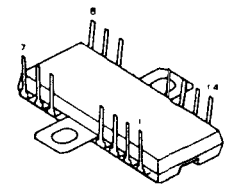
2SA816
2SC1626
2SD837



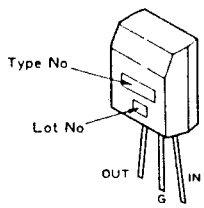
μPC4558C



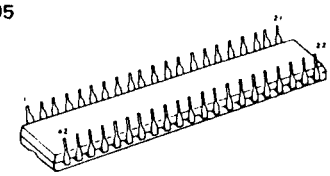
PA2008



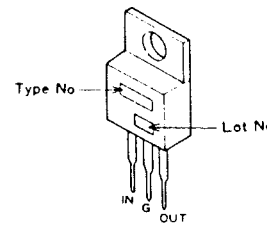
μPC78L08



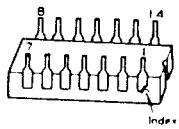
PD6005



μPC78M05H



MB84069B
M53207P



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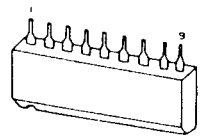
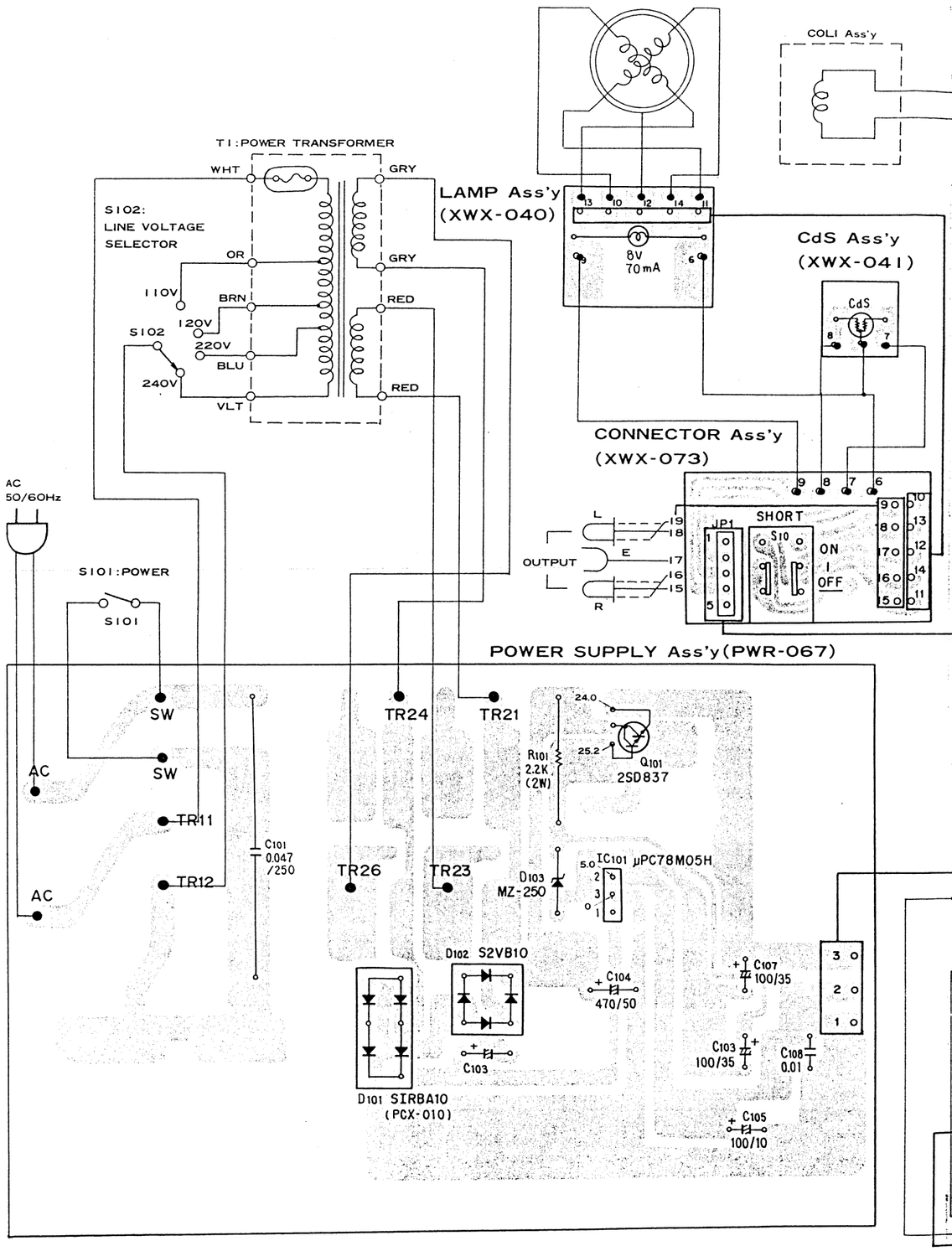
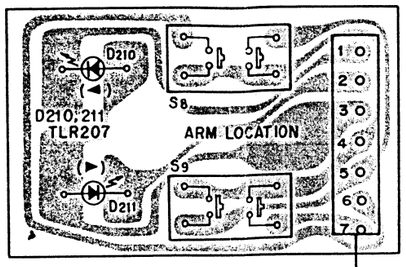


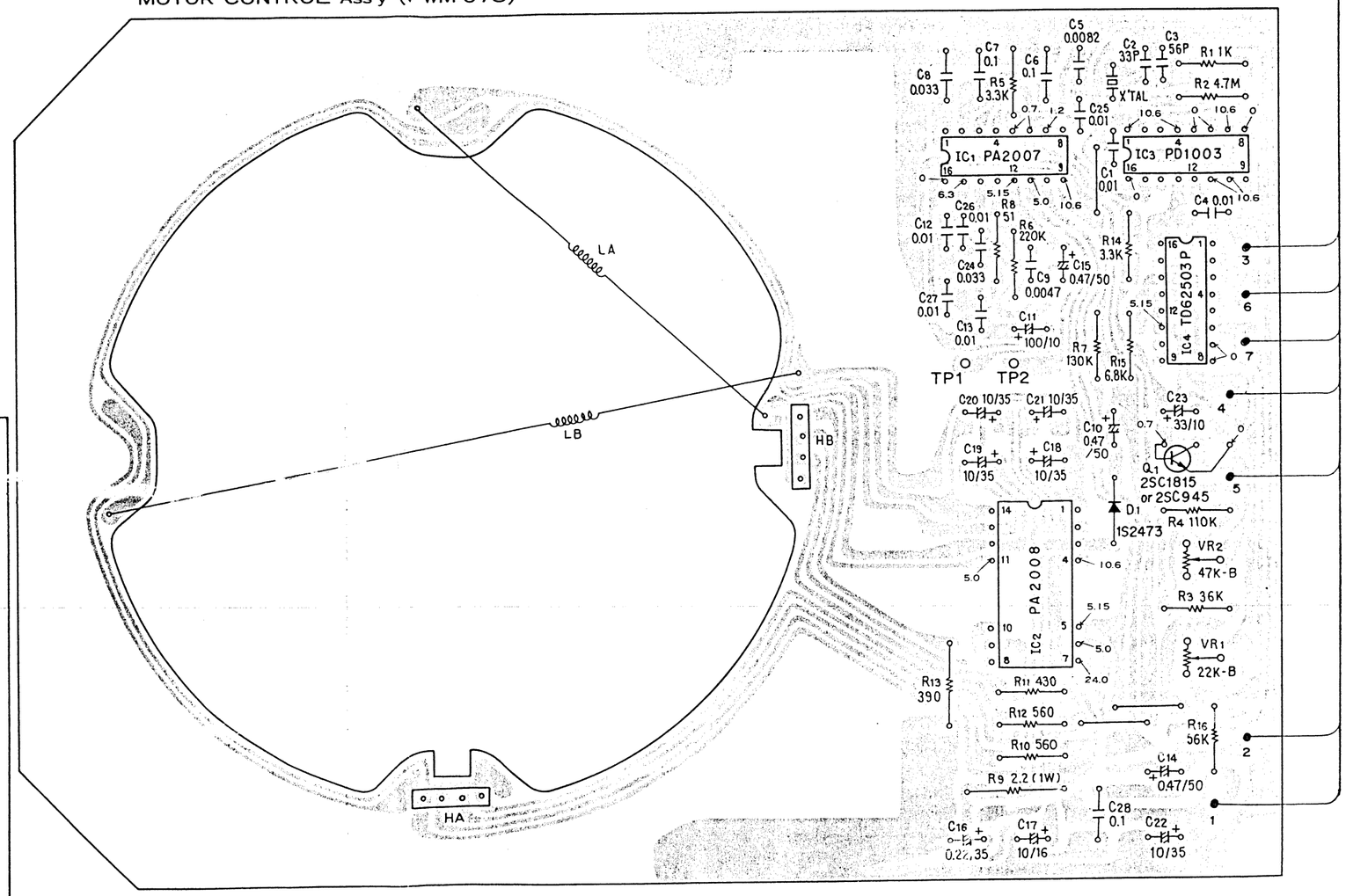
3. P.C.BOARDS CONNECTION DIAGRAM



LOCATION Ass'y (XWX-072)



MOTOR CONTROL Ass'y (PWM-078)



CN1 CN2 CN3 CN4

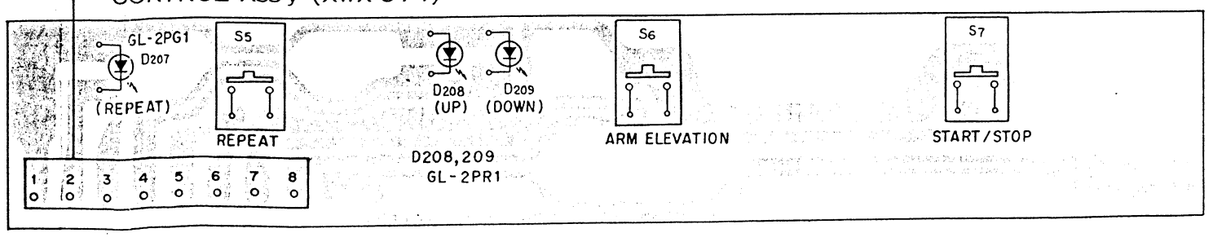
R37 220
R36 220
R10 220
R9 220
R8 220
R7 220
R13 1K
R14 1K
C12 0.047
P9

S2: UP DETECTOR
S1: DOWN DETECTOR
S1,2: PSF-016
MOTOR

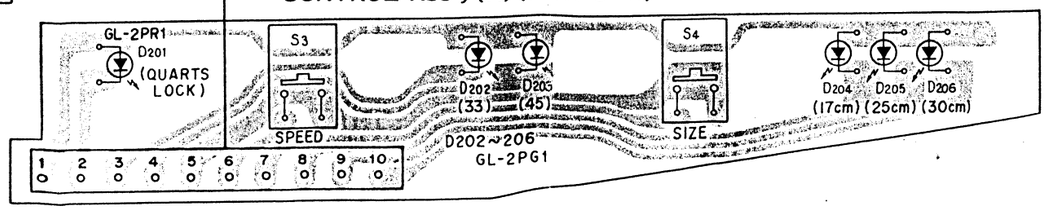
SOLENOID Ass'y

-077)
Q305

CONTROL Ass'y (XWX-074)



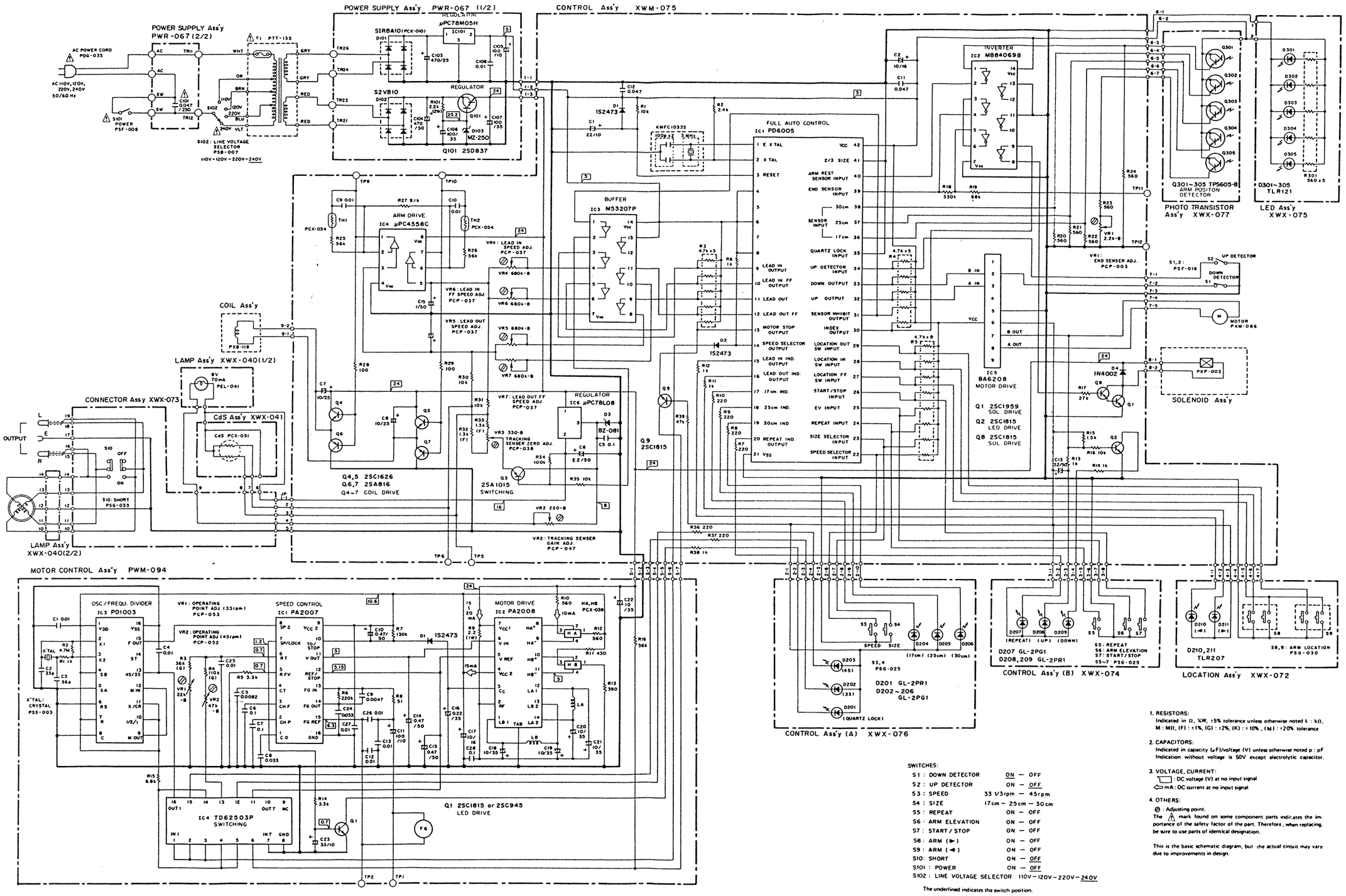
CONTROL Ass'y(A)(XWX-076)



A B C D

4. SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



SWITCHES:

S1 : DOWN DETECTOR	ON — OFF
S2 : UP DETECTOR	ON — OFF
S3 : SPEED	33 1/3rpm — 45rpm
S4 : SIZE	17cm — 25cm — 30cm
S5 : REPEAT	ON — OFF
S6 : ARM ELEVATION	ON — OFF
S7 : START / STOP	ON — OFF
S8 : ARM (▶)	ON — OFF
S9 : ARM (◀)	ON — OFF
S10: SHORT	ON — OFF
S101 : POWER	ON — OFF
S102 : LINE VOLTAGE SELECTOR	110V — 120V — 220V — 240V

The underlined indicates the switch position.

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10%, (M) : ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

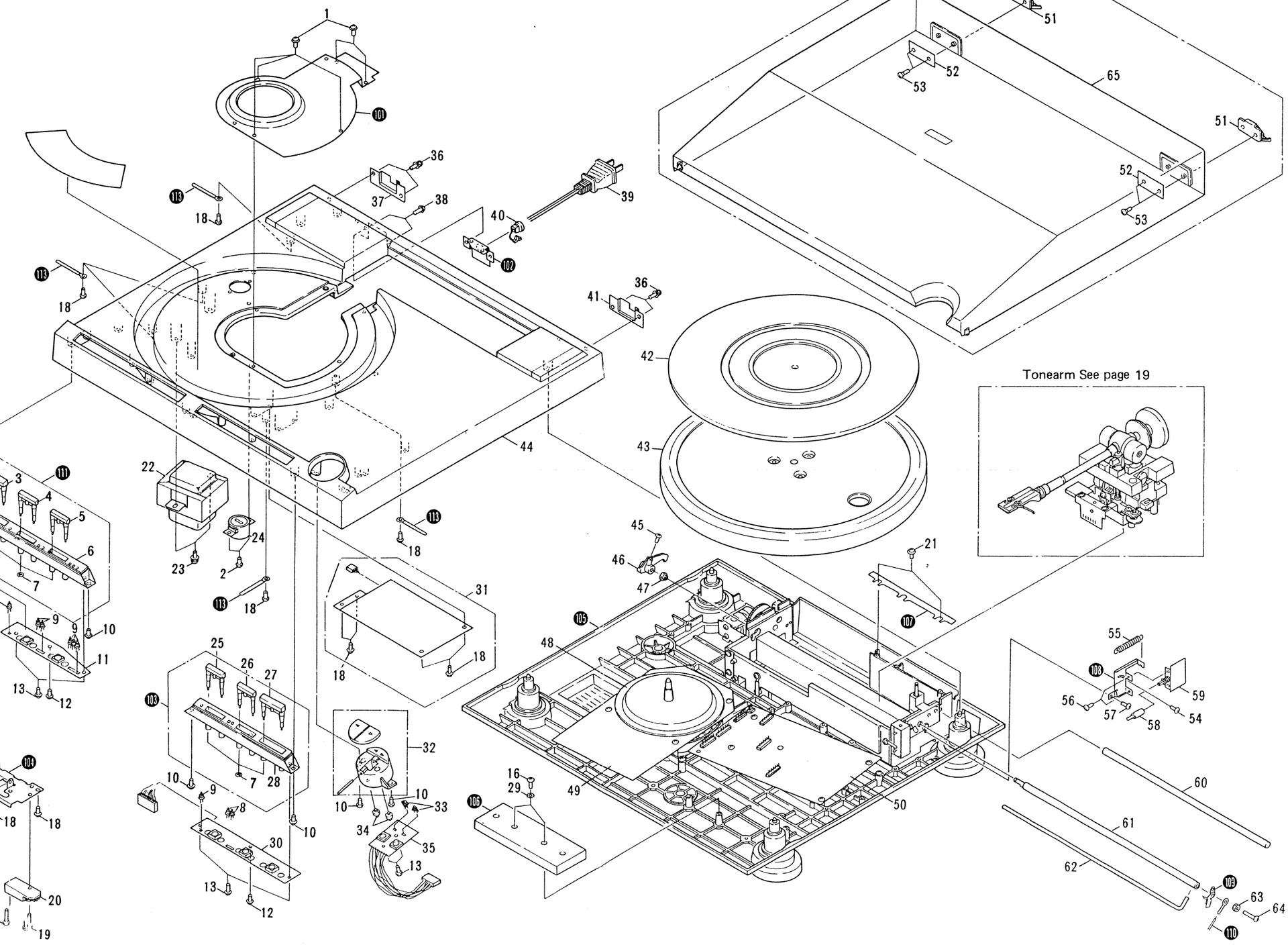
3. VOLTAGE, CURRENT:
▭ : DC voltage (V) at no input signal
⇦ mA : DC current at no input signal

4. OTHERS:
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. EXPLODED VIEWS

5.1 EXTERIOR 1



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ *GENERALLY MOVES FASTER THAN* ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

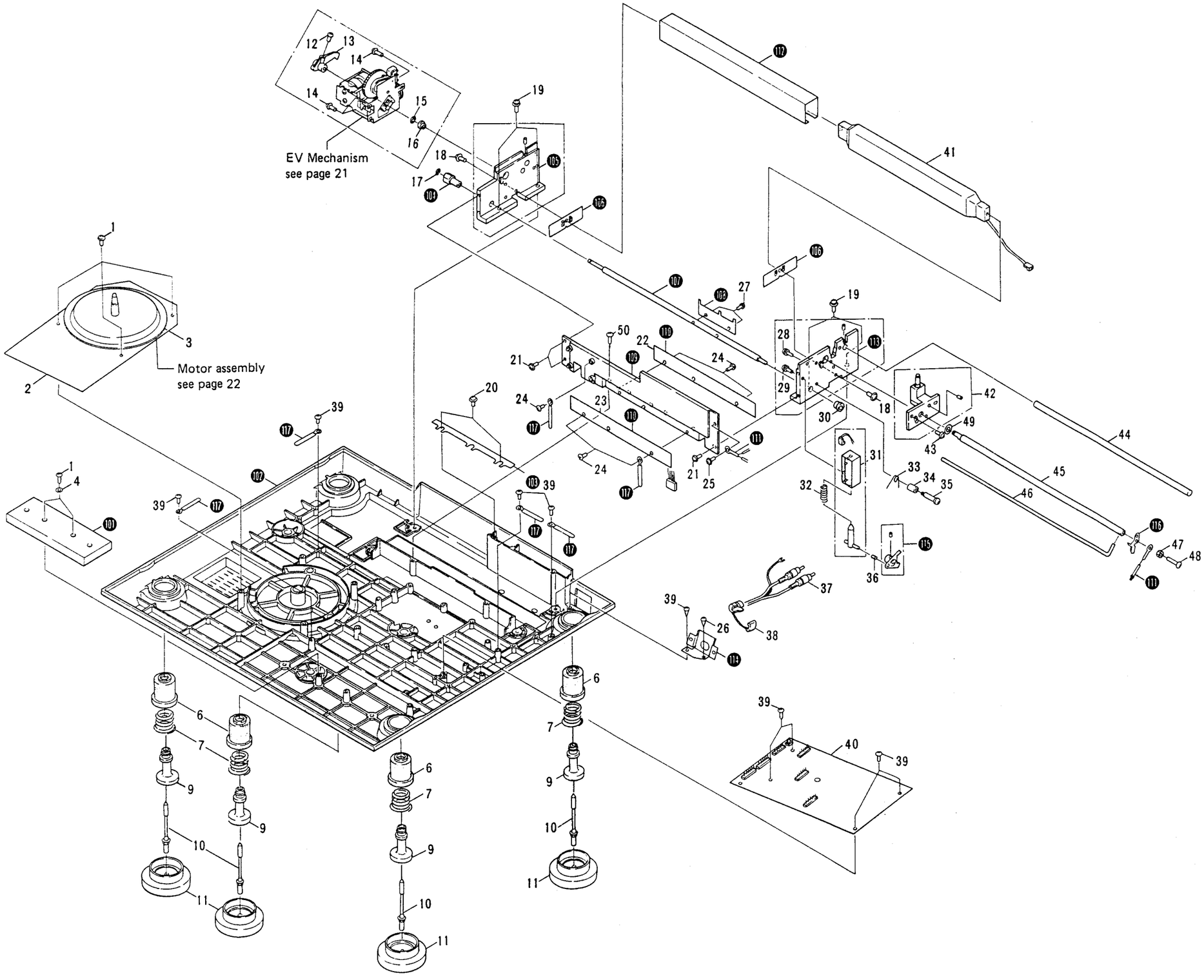
Mark	No.	Part No.	Description
	1.	PMF30P080FZK	Screw
	2.	PAZ30P080FMC	Screw
	3.	PAD-079	Push button unit (A)
	4.	PAD-080	Push button unit (E)
	5.	PAD-081	Push button unit (C)
	6.	PNX-135	Control case (A)
	7.	YS20FBT	Washer
★	8.	GL-2PR1	Diode
★	9.	GL-2PG1	Diode
	10.	IAZ30P080FMC	Screw
	11.	XWX-076	Control assembly (A)
	12.	PAZ30P100FMC	Screw
	13.	PPZ30P080FMC	Screw
	14.	PBA-104	Screw
	15.	PNX-092	Select lever
	16.	PLZ40P120FMC	Screw
⚠ ★★	17.	PSG-017	Push switch
	18.	IAZ30P060FMC	Screw
	19.	PMA30P150FMC	Screw
⚠ ★★	20.	PSF-008	Micro switch
	21.	VBZ30P120FZK	Screw
⚠ ★★	22.	PTT-135	Power transformer (110V,120V,220V,
	23.	PMB40P080FMC	Screw 240V)
⚠ ★★	24.	PSB-007	Line voltage selector
	25.	PAD-083	Push button unit (D)
	26.	PAD-084	Push button unit (F)
	27.	PAD-082	Push button unit (B)
	28.	PNX-130	Control case (B)
	29.	WA42F180M100	Washer
	30.	XWX-074	Control assembly (B)
⚠	31.	PWR-067	Power supply assembly
	32.	PXB-240	Control case (C) assembly
★	33.	TLR207	Diode
	34.	PLM-003	Button
	35.	XWX-072	Location assembly
	36.	IAZ30P080FZK	Screw
	37.	PNW-338	Lock plate (L)
	38.	PMB30P080FZK	Screw
⚠	39.	PDG-035	Power cord
	40.	E32-056	Strain relief
	41.	PNW-339	Lock plate (R)
	42.	PEA-036	Rubber mat assembly
★	43.	PNR-158	Turntable platter
	44.	PNR-156	Panel
	45.	PMZ40P100FMC	Screw
	46.	PNX364	EV lever
	47.	PNW-450	Collar
	48.	PXT-465	Rotor unit
★★	49.	PXM-094	Motor assembly
	50.	XWM-075	Control assembly
★	51.	PXB-245	Hinge assembly
	52.	PNB-105	Plate
	53.	QMZ40P080FCR	Screw
	54.	IAZ30P060FZK	Screw
	55.	PBH-291	Spring
	56.	PMA30P050FMC	Screw
	57.	IAZ30P080FZK	Screw
	58.	PLM-005	Shaft
	59.	XWX-073	Connection assembly
	60.	PLB-132	Guide bar (B)
	61.	PLB-131	Guide bar (A)
	62.	PLB-067	EV bar
	63.	NB30FMC	Nut
	64.	PMZ30P120FMC	Screw
★★	65.	PNV-042	Dust cover
	101.		Top cover
	102.		Plate
	103.		Control case (B) assembly
	104.		Switch base
	105.		Under base
	106.		Weight
	107.		Plate
	108.		Muting base
	109.		Muting lever
	110.		Lead unit (GND)
	111.		Control case (A) assembly
			. . . . .
	113.		Cord cramper

5.2 EXTERIOR 2

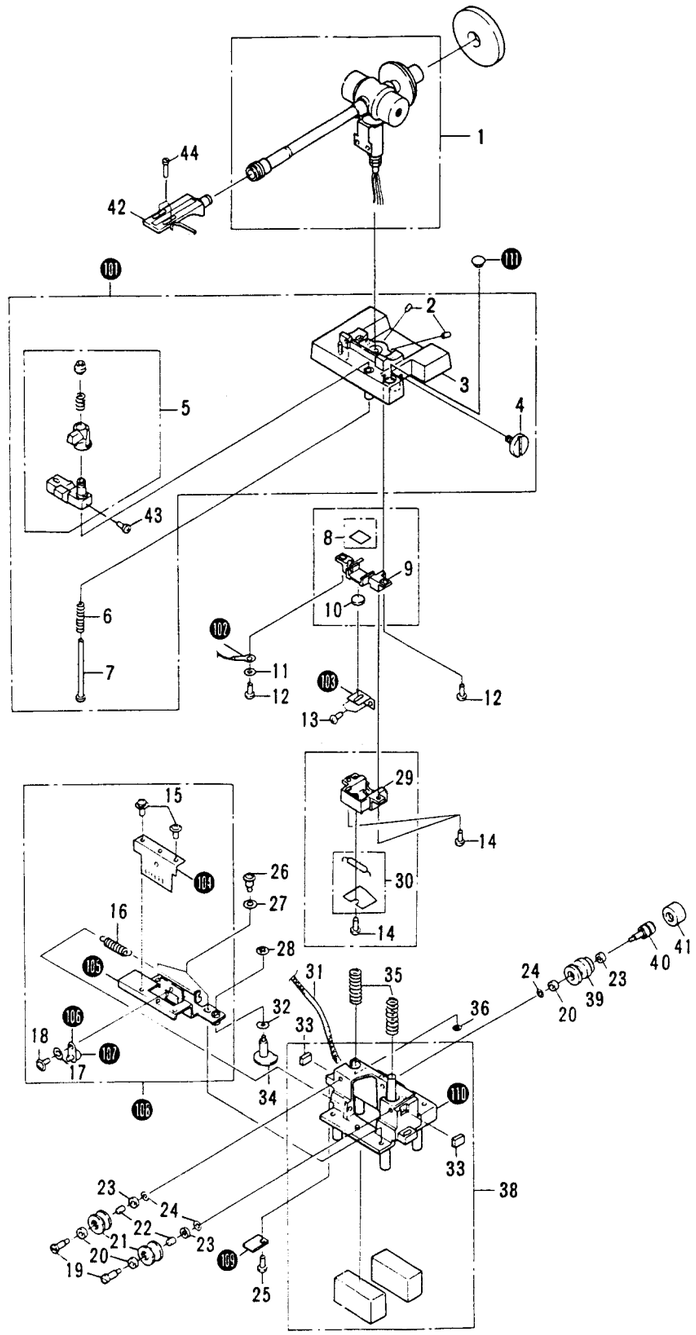
Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PLZ40P120FMC	Screw		101.		Weight
★★	2.	PXM-094	Motor assembly		102.		Under base
	3.	PXT-465	Rotor unit		103.		Plate
	4.	WA42F180M100	Washer		104.		Ajust collar
	5.	....			105.		Stater base (B)
	6.	PEB-102	Rubber cushion A		106.		Plate
	7.	PBH-169	Spring (C)		107.		Index shaft
	8.	....			108.		Index
	9.	PXB-185	Case Assembly		109.		Case
	10.	PBA-105	Screw		110.		Sensor beard unit
	11.	PXT-392	Case unit		111.		Lead unit(GND)
	12.	PMZ40P100FMC	Screw		112.		Coil cover
	13.	PNX-364	EV lever		113.		Stater base (A)
	14.	IAZ30P060FZK	Screw		114.		Plate
	15.	YE60S	Washer		115.		Stopper unit
	16.	PNW-450	Collar		116.		Muting lever
	17.	YE30S	Washer		117.		Cord cramper
	18.	PMA40P120FMC	Screw				
	19.	PMB40P120FZK	Screw				
	20.	VBZ30P120FZK	Screw				
	21.	IAZ30P080FMC	Screw				
	22.	XWX-077	Photo transistor assembly				
	23.	XWX-075	LED assembly				
	24.	PPZ30P080FMC	Screw				
	25.	PAZ30P080FMC	Screw				
	26.	VTZ30P080FMC	Screw				
	27.	PMA30P060FZK	Screw				
	28.	PMA26P050FMC	Screw				
	29.	PMA26P080FMC	Screw				
	30.	PNX-127	Index collar				
	31.	PXP-003	Solenoid assembly				
	32.	PBH-252	Spring				
	33.	PBH-262	Spring				
	34.	PEB-155	Stopper rubber				
	35.	PBA-107	Stopper screw				
	36.	PEB-170	Solenoid tube				
	37.	PDE-092	PU cord				
	38.	PEC-051	Strain relief				
	39.	VTZ30P120FMC	Screw				
	40.	XWM-075	Control assembly				
	41.	PXB-118	Coil assembly				
	42.	PXB-119	Cramper assembly				
	43.	IAZ30P080FZK	Screw				
	44.	PLB-132	Guide bar (B)				
	45.	PLB-131	Guide bar (A)				
	46.	PLB-067	EV bar				
	47.	NB30FMC	Nut				
	48.	PMZ30P120FMC	Screw				
	49.	WA82D120D050	Washer				
	50.	PBA-080	Screw				

Exterior 2



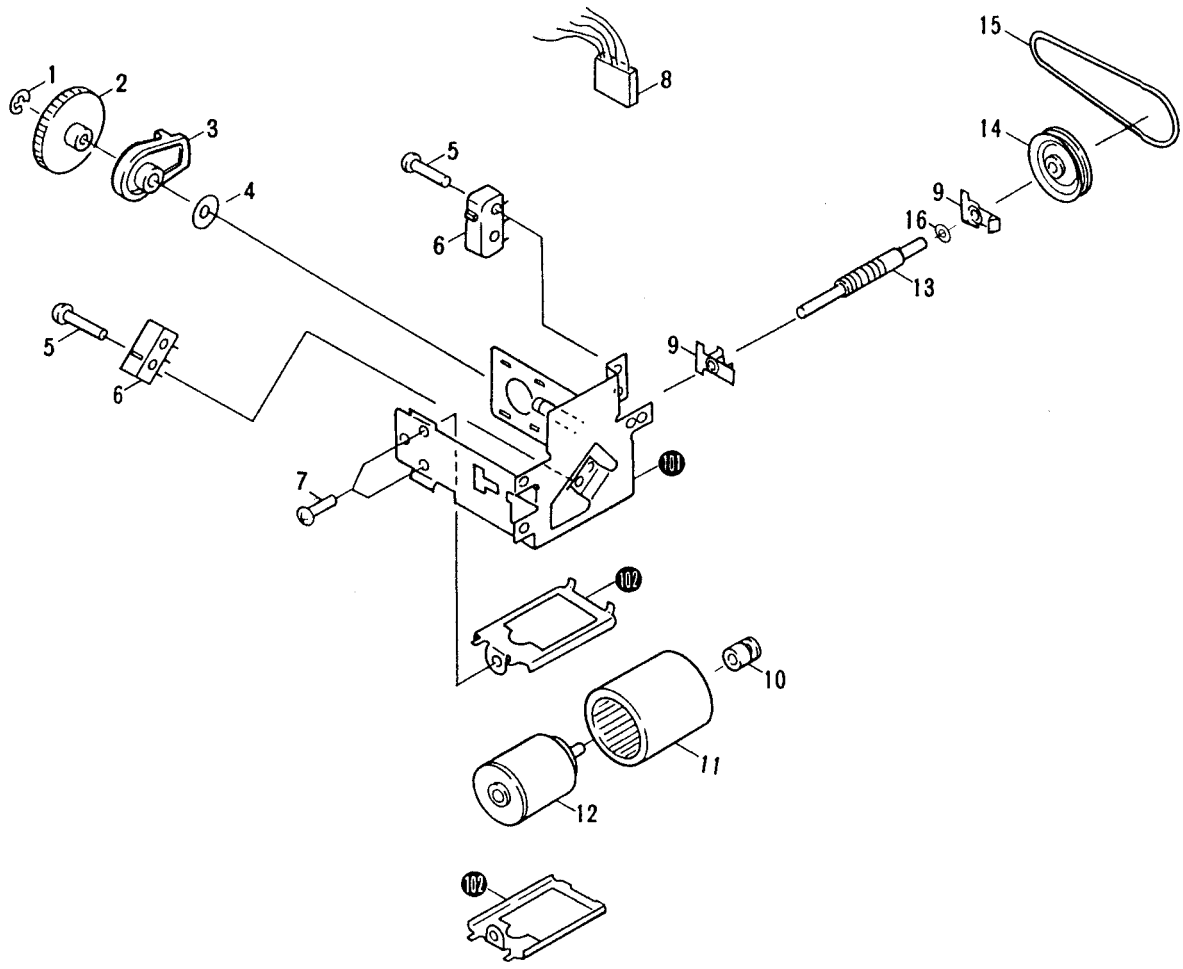
5.3 TONEARM



Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
★★	1.	PPD-623	Tonearm assembly		101.		Carrier base (A) assembly
	2.	ZMK30H050FZK	Screw		102.		Lead unit (GND)
	3.	PNR-157	Carrier base (A)		103.		Shutter
	4.	PXT-421	Fixed screw assembly		104.		Shutter
	5.	PXB-218	EV sheet assembly		105.		Plate unit
	6.	PBH-281	EV spring		106.		Pin unit
	7.	PXT-415	EV shaft unit		107.		Damper cushion
	8.	XWX-041	Cds assembly		108.		Plate assembly
	9.	PNX-103	Spacer		109.		Cord clamper
★	10.	PCX-051	Cds		110.		Carrier base (B)
	11.	WB26FMC	Washer		111.		Rubber
	12.	PMZ26P060FMC	Screw				
	13.	PMZ26P040FZK	Screw				
	14.	PLZ26P080FMC	Screw				
	15.	IDZ30P060FZK	Screw				
	16.	PBH-313	Shutter spring				
	17.	WA41D065D013	Washer				
	18.	PBA-094	Screw				
	19.	PLB-047	Roller shaft				
	20.	PXB-120	Bearing				
	21.	PLB-075	Roller				
	22.	PNC-145	Spacer				
	23.	PXB-121	Bearing				
	24.	PBE-017	Washer				
	25.	PTZ26P040FMC	Screw				
	26.	PBA-127	Screw				
	27.	WA42D080D025	Washer				
	28.	YS40FBT	Washer				
	29.	PNX-102	Coupler base				
	30.	XWX-040	Lamp assembly				
	31.	PDA-019	Shield tube assembly				
	32.	PBE-019	PU spring washer				
	33.	PEB-171	Rubber pad				
	34.	PLM-004	Adjustment cam				
	35.	PBH-254	Spring				
	36.	YP20S	Washer				
	37.	. . .					
	38.	PYY-103	Carrier base (B) assembly				
	39.	PLB-059	Damper shaft (A)				
	40.	PXT-394	Damper shaft (B) unit				
	41.	PEB-158	Damper cap rubber				
	42.	PXA-809	Head shall assembly				
	43.	PXT-463	Screw assembly				
	44.	PBA-909	Screw (W)				
		PPB-935	Cartridge				
		N64-698	Cartridge weight				

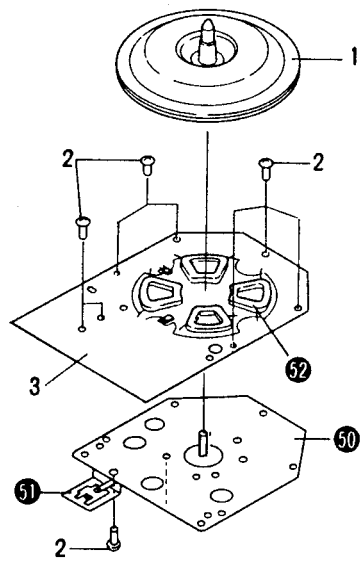
5.4 EV MECHANISM



Parts List

Mark	No.	Part No.	Description
	1.	YE30S	Washer
	2.	PNW-394	Gear (R)
	3.	PNX-272	Cam
	4.	WA51F080M50	Washer
	5.	PTZ20P100FMC	Screw
★★	6.	PSF-016	Micro switch
	7.	PMA26P050FMC	Screw
	8.	PDE-116	Connector assembly
	9.	PNW-391	Collar
★	10.	PNW-392	Motor pulley
	11.	PEB-167	Tube
★★	12.	PXM-086	Motor
	13.	PNW-485	Worm unit
★	14.	PNW-393	Pulley
★★	15.	PEB-097	Belt
	16.	PBF-009	Washer
	101.		Base unit
	102.		Frame

5.5 MOTOR ASSEMBLY



Parts List

Mark	No.	Part No.	Description
	1.	PXT-465	Rotor unit
	2.	PCZ30P050FMC	Screw
	3.	PWM-078	Control assembly
	50.		Base unit
	51.		Heat sink
	52.		Coil

6. ADJUSTMENT

6.1 MUTING TIMING ADJUSTMENT

1. The PL-L1000A is equipped with a muting circuit which mutes the noise generated when the arm elevation is in the up position.
2. Set the arm elevation switch in the up position, and insert a 2.5mm spacer in between the elevation lever and the cam (Fig. 6-1).
3. Loosen screw ❶, adjust the gap between the muting lever and the muting shaft up to 0.1mm, and then retighten screw ❶.
   Check that the muting lever and muting shaft are not in contact, and that the muting hence is not inclined at an angle.
4. After completing this adjustment operation, check that the muting is cancelled within 2 seconds after the stylus is lowered onto the record when the stylus height is set to 6mm, and within 0.3 seconds when set to 10mm. If these muting timing ratings are not satisfied, repeat the adjustment operation.

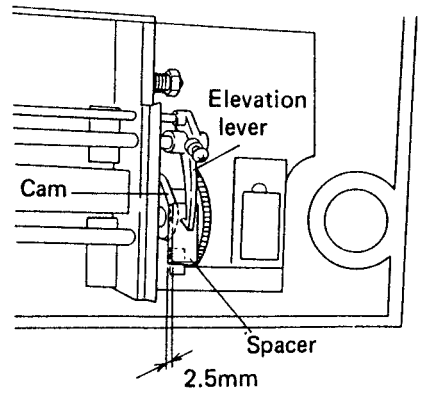


Fig. 6-1 Muting timing adjustment 1

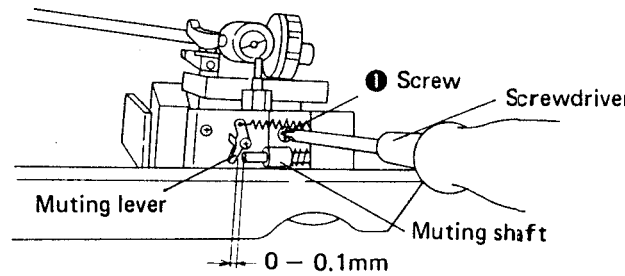


Fig. 6-2 Muting timing adjustment 2

6.2 END SENSOR SENSITIVITY ADJUSTMENT

1. Set the arm elevation switch in the up position, and connect an oscilloscope to test points TP11 and TP12.
2. With the tonearm in a position near the end of the record, hold the carrier by hand and move it to left and right at about 5 to 10cm/sec.
3. Adjust VR1 to obtain a waveform in the oscilloscope as shown in Fig. 6-4 . (The top and bottom halves of this waveform should be symmetrical with a slight amount of clipping at the top and bottom).

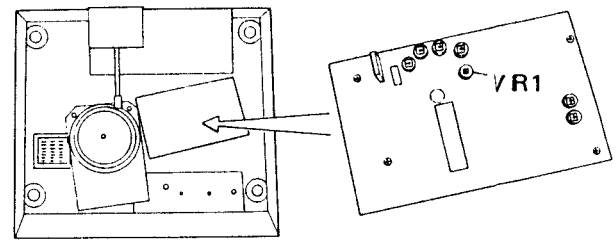


Fig. 6-3 End sensor sensitivity adjustment

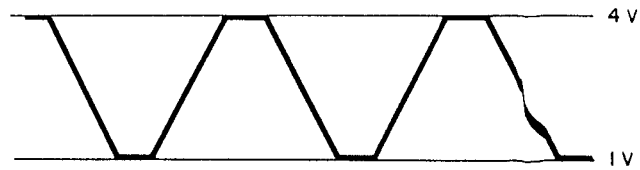


Fig. 6-4 Waveform

6.3 LOCATE SPEED ADJUSTMENT

1. The locate speed is to be adjusted before the lead-in and return adjustments.
   Check that the PL-L1000A is quite horizontal, and that the tracking force has been set to a suitable value.
2. Adjust VR4 to obtain a voltage of about 9V between TP9 and TP10 when the locate-in button is pressed continuously to the 1st level.
3. Then check that the carrier comes to a stop within 16 to 30 seconds after starting with the locate-in button pressed continuously to the 1st level, and that the carrier starts, travels and stops smoothly.
4. With the locate-out button then pressed to the 1st level continuously, adjust VR5 in the same way as in step2, and check for the same smooth movement as in step 3.

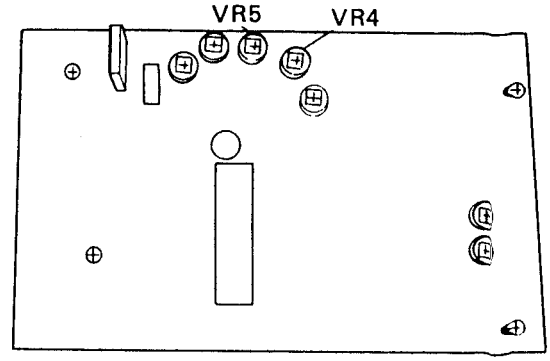


Fig. 6-5 Locate speed adjustment

The speed adjustments for the 2nd level are performed during the lead-in and return speed adjustments.

6.4 TRACKING SENSOR ZERO ADJUSTMENT

1. Set the elevation switch to the up position, and adjust VR3 to obtain of voltage of less than 100mV between test points TP9 and TP10.
2. Then proceed with the arm elevation operation and all the automatic operations. Reset the elevation switch to the up position and measure the voltage between TP9 and TP10 again. The voltage should be within ±350mV.
3. A voltage in excess of 3V indicates a loose elevation bearing or loose tonearm, or other defective parts which must be replaced.

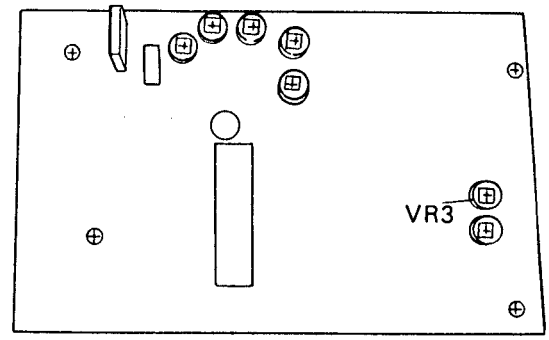


Fig. 6-6 Tracking sensor zero adjustment

6.5 TRACKING SENSOR GAIN ADJUSTMENT

1. Connect a millivoltmeter to test points TP5 and TP6, and move the carrier base by hand to the start of play position for 17cm records.
2. Loosen the carrier base at this position and retighten at the position where the meter reads 0V.
3. Swing the end of the tonearm (stylus position) 4mm to the left, adjusting VR2 to obtain a meter reading of about 1.2 to 1.25V.
4. Then swing 4mm to the right, and check that the meter reading is within ±0.15V of the reading obtained in step 3 above.
5. Repeat steps 3 and 4 serval times. Note that swinging the end of the tonearm by more than 4mm can result in the generation of ghost phenomenon.

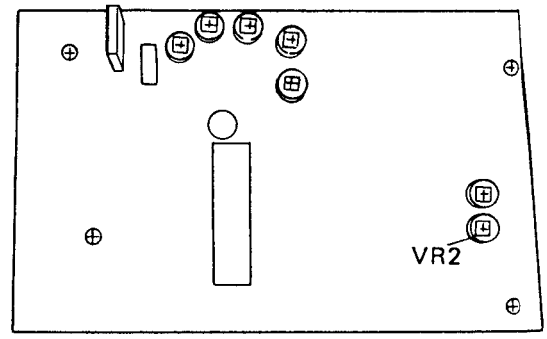


Fig. 6-7 Tracking sensor gain adjustment

6.6 LEAD-IN AND RETURN SPEED ADJUSTMENTS

1. Mount the turntable platter, check that the carrier is quite horizontal and then play an actual 17cm record.
2. Press the START/STOP button, and adjust the time for horizontal tonearm movement to 5.0 ~ 5.5 seconds.
   Adjust VR6 for lead-in time and VR7 for return time.
3. Then check that the voltage between test points TP9 and TP10 does not exceed 18V.

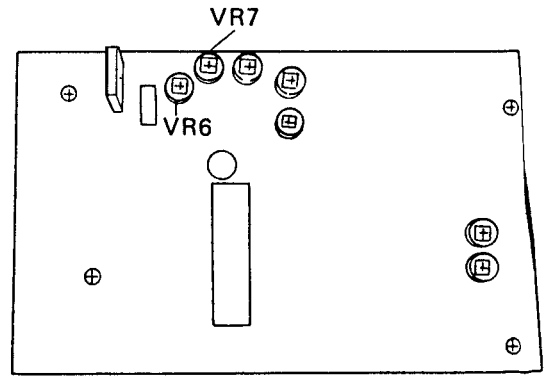


Fig. 6-8 Lead-in and return speed adjustment

6.7 MOTOR OPERATING POINT ADJUSTMENT

1. Set the speed to 33 1/3 rpm and depress the START/STOP button to put the unit into the operational mode.
2. Connect a buffer amp to pin 1 of IC PA2007, and connect the output to a oscilloscope (Fig. 6-9).
3. When a waveform like that shown in Fig. 6-10 is obtained, vary oscilloscope gain until a sawtooth wave with 5 div. peak-to-peak is obtained. Then, referring to Fig. 6-10, adjust VR1 until ⓐ to ⓑ equals 3 to 2. (Make sure noise does not affect adjustment.)
4. When the 33 1/3 rpm adjustment is completed, adjust VR2 using the same procedure (item 2 and 3 above) for 45 rpm. Always adjust 33 1/3 first, and always adjust 33 1/3 if 45 rpm is to be adjusted even though it might be accurate.
5. Connect pin 7 of PA2007 to a oscilloscope and make certain the frequency for 33 1/3 rpm is 111.1Hz, and that for 45 rpm is 150Hz.

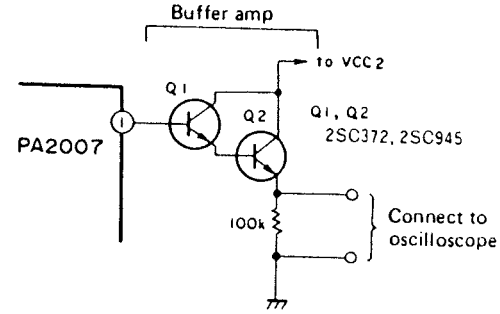


Fig. 6-9 Connect buffer amp

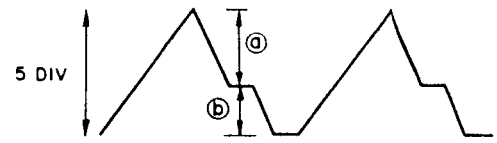


Fig. 6-10 Waveform

6.8 TONEARM LOWERING POSITION ADJUSTMENT

When the tonearm doesn't lower in the right position during automatic playback, adjust according to the following procedures. (Be careful not to damage the record disc with the stylus while making this adjustment.)

1. Place a 30cm record on the platter.
2. Depress the START/STOP switch and start automatic playback. Note the direction and amount the lower position is off.
3. Depressing the START/STOP switch, return the tonearm to its base lock.
4. After the platter has stopped rotating, lock the arm base lock and remove the rubber plug from the adjustment access hole.
5. Release the arm base lock, refer to the illustration at the right and adjust as follows using a small flat bladed screwdriver:
   - When the stylus lowers to the outside of the record, turn the screw clockwise (↷).
   - When the stylus lowers too far to the inside of the record, turn the screw counterclockwise (↶).
6. Depress the START/STOP switch and check the adjustment. If the lowering position is still off, repeat steps 3. through 6. above.
7. When the adjustment is completed, lock the arm base lock and replace the rubber plug in the adjustment access hole.

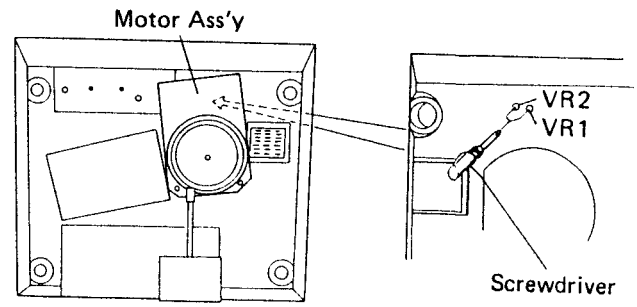


Fig. 6-11 VR1, VR2 position

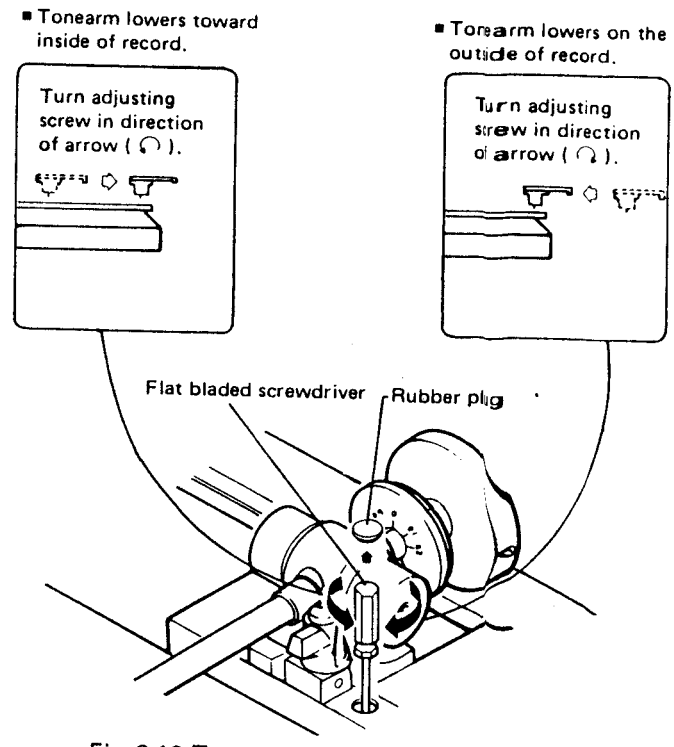
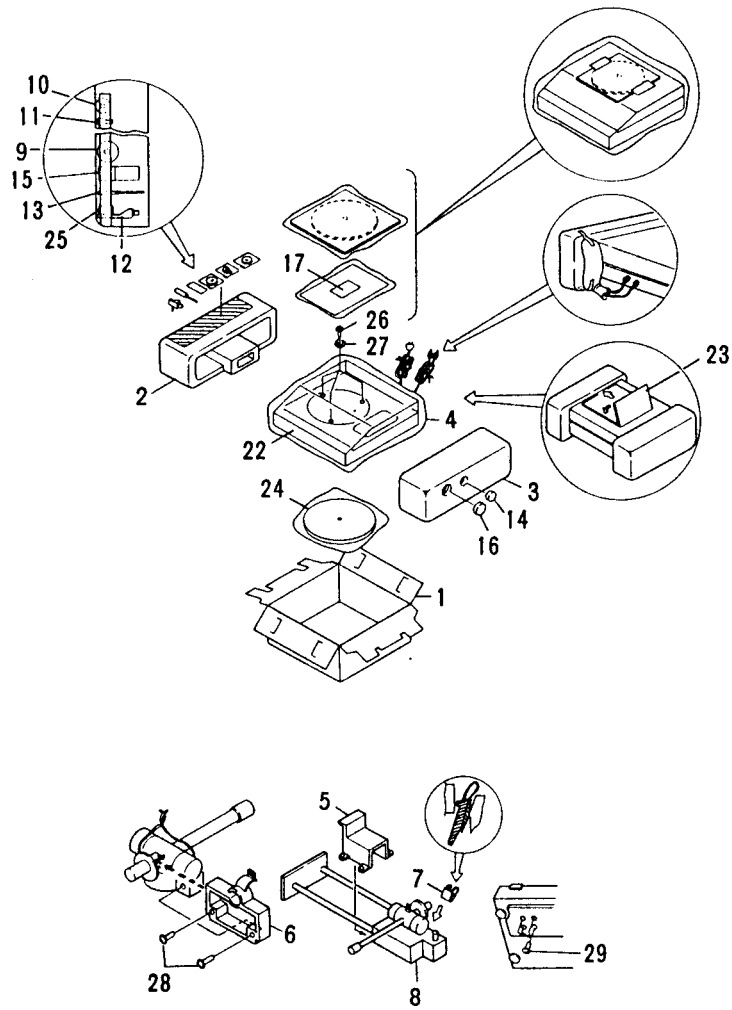

■ Tonearm lowers toward inside of record.
Turn adjusting screw in direction of arrow (↶).
■ Tonearm lowers on the outside of record.
Turn adjusting screw in direction of arrow (↷).
Flat bladed screwdriver
Rubber plug

Fig. 6-12 Tonearm lowering position adjustment

7. PACKING



Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PHG-469	Packing case		16.	PAW-007	Water level
	2.	PHA-109	Protector (L)		17.	PED-016	Cleaning cloth
	3.	PHA-110	Protector (R)		18.	· · ·	
	4.	PHL-006	Cover		19.	PRB-187	Operating instructions
	5.	PNX-097	Carrier spacer		20.	· · ·	
	6.	PNX-098	Tonearm holder				
	7.	PNW-401	Spacer (A)		21.	· · ·	
	8.	PEB-100	Rubber bush		22.	PHL-015	Cover
★	9.	PXB-224	Weight assembly		23.	PHC-049	Top spacer
★	10.	PXB-223	Weight assembly (Small)		24.	PHL-012	Cover
					25.	PPB-935	Cartridge assembly
★	11.	PLB-105	Sub-weight				
	12.	PXA-809	Headshell assembly		26.	PBA-079	Screw
	13.	KEX-002	Screwdriver		27.	B22-026	Washer
	14.	N93-603	45 adapter		28.	PMZ30P120FMC	Screw
	15.	PEC-012	Overhang gauge		29.	PMZ40P160FMC	Screw